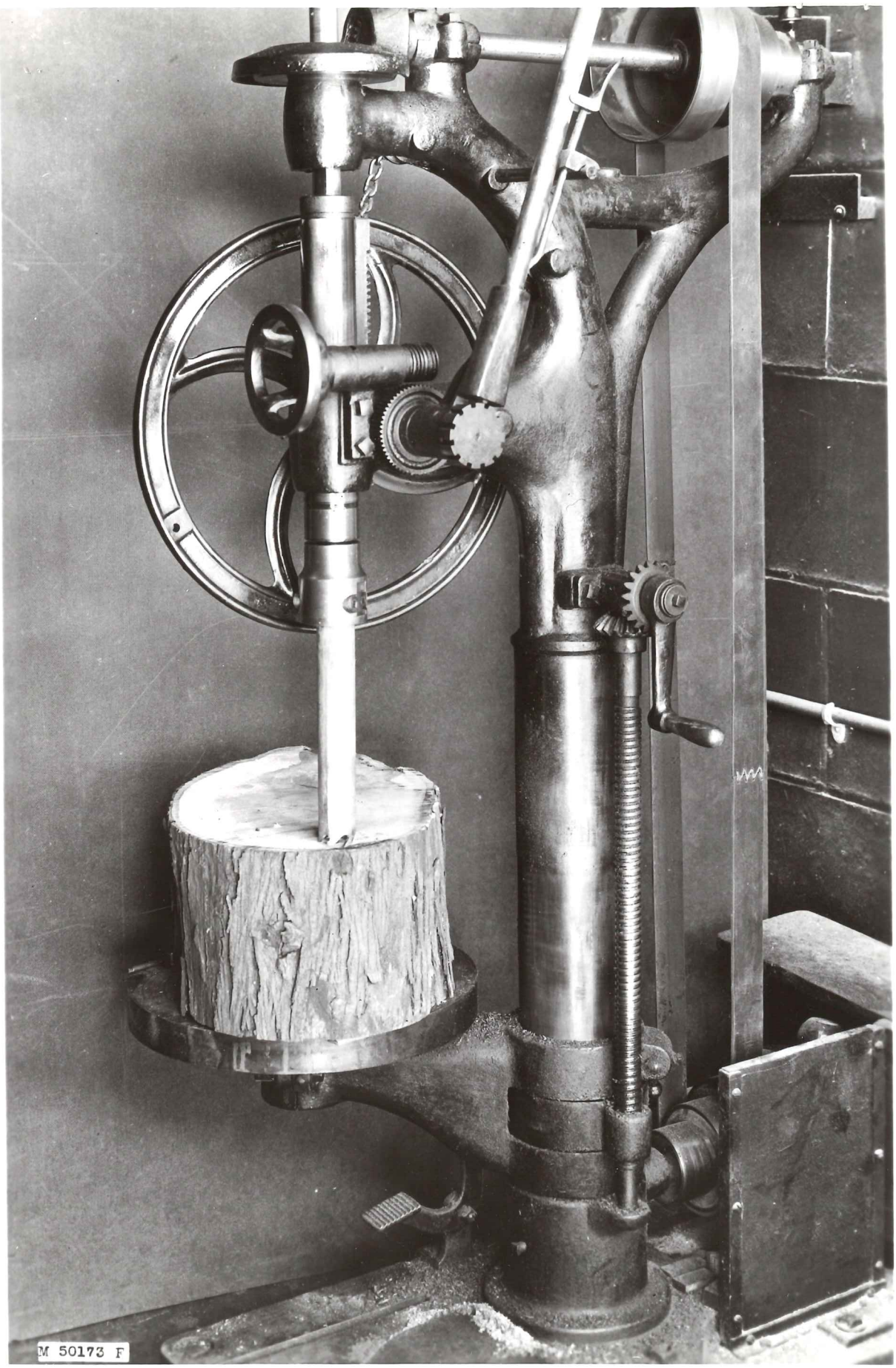
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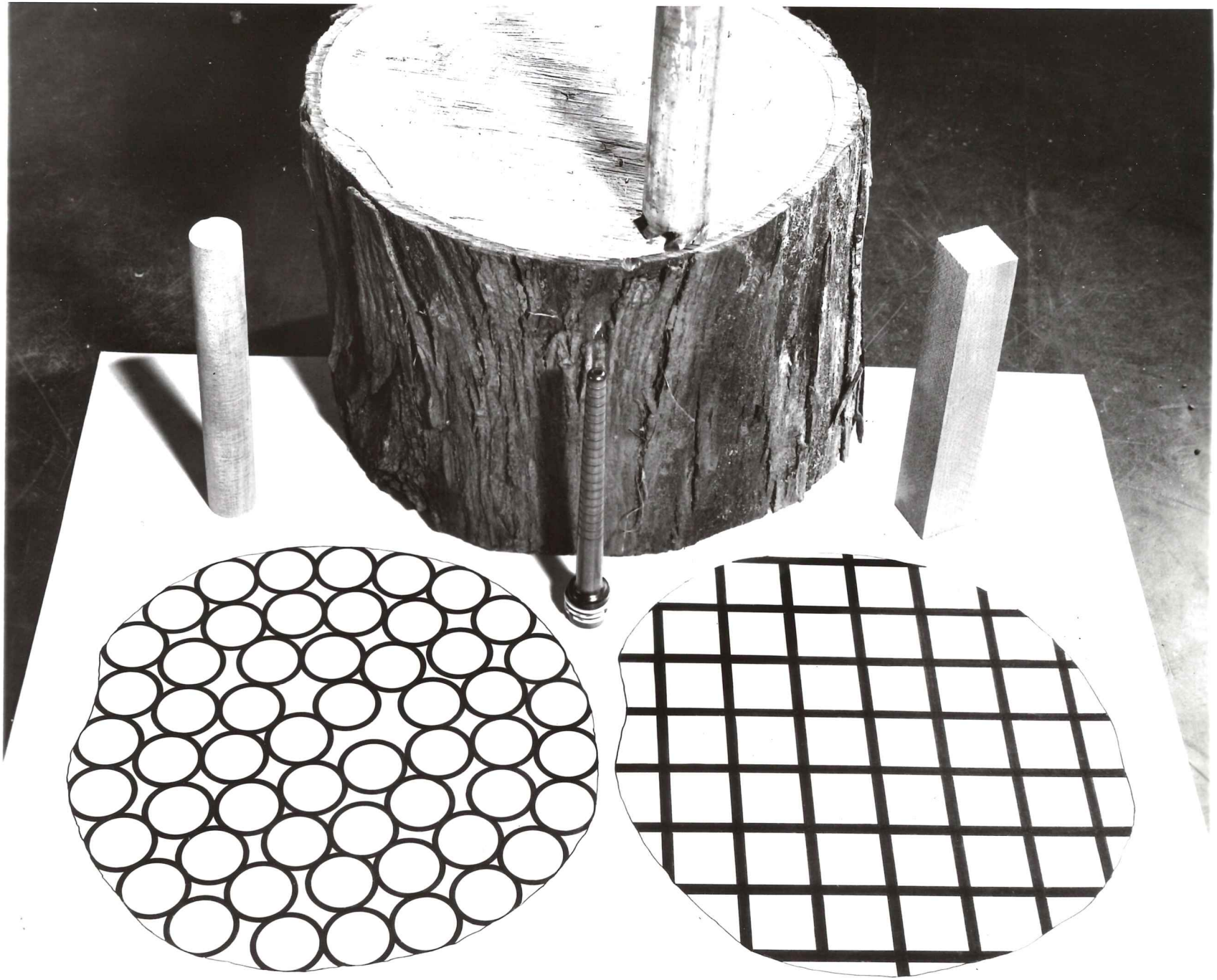

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"Canadian Woodworker". Feb. 1944.

ound Bobbin Blanks Saves Material

Pages 24, 25 & 34.

Using Tubular Saw Proves Decided Improvement Over Conventional Method

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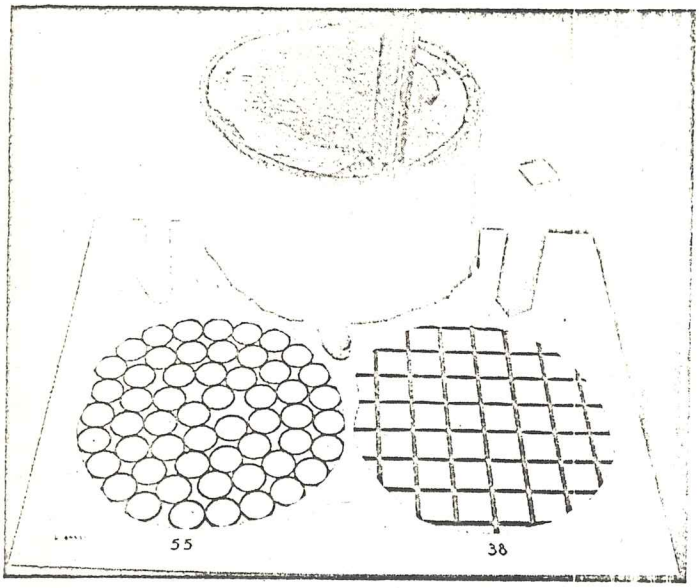
by JOE DONNY, Assistant Industrial Specialist, Forest Products Laboratory*

Studies at the Forest Products Laboratory indicate that a method of cutting bobbin blanks radically different from that now practiced offers opportunity to increase the yield from maple logs and decrease the labor required. Because of the importance of bobbins to the textile industry in producing essential war materials special study was devoted to finding such a method. So far as is known, this method has not been used previously in the production of bobbins or any similar product. It may have been used in specialized woodworking operations with which the writer is not familiar. One of the purposes of this article is to invite comment from those in the woodworking trade who may have made use of the method directly or in modified form for the production of other products. Such trade experience, more than any other procedure, should facilitate prompt decision as to whether the method is practical.



Theoretical cutting diagrams (left and right respectively) for tube-saw and conventional methods of cutting bobbin blanks. Numbers indicate theoretical number of blanks obtained by improved and conventional methods.

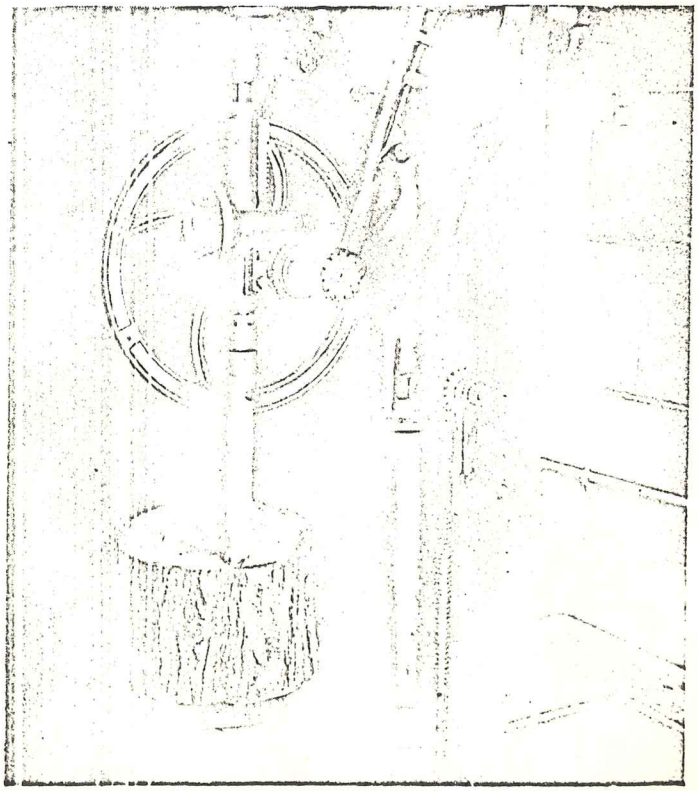
A plug-cutting operation is the closest parallel to the "tube cutter" here described, although the conditions applicable to plug cutting are so different that the parallel is not very close.

Present methods of producing bobbin blanks vary in detail. A common method is first to cut the log into bolts corresponding in length to three or four bobbin blanks; the bolts are then sawed on a bolter into 1-7/16-inch flitches which are further ripped into squares on a single circular power ripper. A ¼-inch saw kerf is necessary in breaking down the logs by this method. In some cases, full-length logs are split on a headsaw and then each half is turned on the saw carriage and flitched.

The squares are cut to bobbin-blank length and rough turned prior to seasoning on a back knife lathe to 1⅜-inch round tapering blanks. After seasoning they are turned to finished dimensions.

As the service rendered by bobbins in use is somewhat affected by the straightness of grain, some care is taken to produce material as straight-grained as possible. In earlier times, bobbin blanks were split out to produce straight-grained stock.

In studying methods of getting maximum yield of 1⅜-inch rough rounds from a bolt, it was apparent that if the rounds could be cut directly from the bolt instead of from squares considerable waste would be saved. Any method that would permit cutting around the circumference of a bolt instead of grid-wise could take advantage of the fact that one-third to one-half the volume in an average bolt is contained within the outer



Simple drill set-up of tube saw for cutting bobbin blanks.

*Maintained at Madison, Wis., in co-operation with the University of Wisconsin.

1⅜-inch ring—a portion largely slabbed off in straight-line sawing. Moreover, the clearest part of the log would be utilized and the central defective portion scrapped without further processing at the first appearance of defects. Further, the use of bolts shorter than those now used in the bolter or headsaw method should permit the utilization of logs or parts of logs uneconomical to use with present methods.

Diagrams, as shown in Fig. 1, indicate that theoretically the yield is increased by 40 to 50 per cent by cutting rounds directly from the log instead of from squares.

The cutting of rounds directly from the bolt by means of a tube cutter seemed feasible because of the fact that there would be opportunity to expose the outside edge of the cutter for a short distance on the circumference of the cut to provide exit for the sawdust—a condition not usually existing in deep circular cuts.

To test the performance of a tube saw, a cylindrical cutter was made with a 1⅝-inch outside diameter, a ⅛-inch wall, and a 14-inch length. The tube was fitted with six equally spaced rip teeth having a 30-degree rake angle and swaged to approximately 5/32-inch for cutting clearance. The cutter was chucked in a wood lathe and operated at a spindle speed of 2,400 revolutions per minute. A maple bolt of standard bobbin length was held on the tool rest and fed into the cutter. It was found that the cuts could be made rapidly and without difficulty at the rate of about 1 second for the complete round. The saw kerf was further reduced to 3/32-inch by using tubing of 1/16-inch wall thickness and set teeth.

The commercial application of this method of cutting would appear to be in connection with a simple drill-press mounting, as shown in Fig. 2 or with a boring machine. The tool would be fitted with an ejector for throwing the rounds out of the cutter. The logs would be crosscut to the length of the rough bobbin and the discs placed on

(Continued on page 34)

CUTTING ROUND BOBBIN BLANKS

(Continued from page 25)

the table of the drill press or boring machine. Little or no dogging to the table would be required. The feed of the cutter could be foot operated or the machine equipped with an automatic stroke attachment, the operator shifting the disc by hand for each successive cut. For full automatic operation, a drilling machine with indexing table would be feasible. The use of a tilting table would permit cutting for maximum straightness of grain and, if necessary, "straightening the grain" of spiral- or diagonal-grained discs. This feature would be of special importance to products other than bobbins that might be cut by the same process, such as, ladder rungs, short tool handles, etc.

The application of the principle to the production of longer rounds, such as baseball bats and maul handles, would probably be through the operation of the tube cutter in a horizontal plane, feeding the bolts to the cutter by means of a carriage designed for the purpose. On a horizontal application, the rounds could pass on through the open-end cutter.

Information on comparative labor requirements by the two methods of manufacture can be obtained only by tests in actual production. Tube sawing eliminates the rough turning operation now used. The rate of feed possible in tube sawing does not appear to be substantially different from ripping a square from a flitch. The time required for shifting the piece into the next cut would probably be somewhat greater with the tube saw than with the ripsaw, but the overall difference would not appear to be unfavorable to the tube-sawing method.